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5 New introduction to the description:

Chain lock

**Technical field**

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The invention relates to a chain lock for link chains having two lock parts which can be displaced by limited amounts with respect to each other in the longitudinal direction of the lock in order to open and close the lock and in each case have two ends which are connected to each other via a longitudinal web and of which in each case one forms a stud having a retaining web extending over part of the circumference of the stud and one is provided with a recess serving to receive the stud and having a retaining groove for the retaining web.

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**Prior art**

25 A chain lock of the above type is disclosed in DE patent 23 54 028. In the case of the known chain lock, the retaining stud is provided with an individual retaining web and the recess is provided with an individual retaining groove assigned to the retaining web, the supporting surface of the retaining web, which supporting surface serves to transmit transverse forces, and the mating surface of the retaining groove, which mating surface interacts with said supporting surface, running parallel to the longitudinal central plane of the lock and slightly offset with respect thereto. As has been shown in practice, with increasing static and dynamic loading, the retaining web is the

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part of the chain lock which is subjected to the greatest amount of stress. Taking account of this circumstance, it has been proposed in DE 26 38 443 to design the retaining webs and retaining grooves in a beveled manner in order thereby to obtain an increase of the cross section of the retaining stud. However, a noticeable improvement of the strength cannot be achieved in this manner even if, following the teaching of DE 77 05 179 U, the connecting point - as is conclusive per se - is arranged in a region of the ends of the lock parts, in which the distribution of stress is comparatively balanced. The reason for the success sought with regard to an improved static and dynamic strength failing to materialize may be found in the last-mentioned cases in the fact that due to the beveled position of the retaining web and the retaining groove, the portion of tensile forces which are to be absorbed by that end of the retaining web which is directed toward the interior of the lock takes on values which lead to the retaining web tearing off in the abovementioned region.

In addition, chain locks are known which have means in the region of their longitudinal webs, which means are intended to prevent a constricting effect from occurring in this region. In the case of chain locks known from DE 298 11 332 U and DE 199 14 014 C2, these means are formed by supporting elements which protrude into the interior of the lock and are supported either directly on one another or with the interconnection of an additional element. In the case of the chain lock according to DE 298 11 332 U1, the supporting elements additionally engage behind themselves in order to contribute to the transverse strength of the chain lock. A similar effect is sought in the case of a chain lock known from DE 83 20 392 U, which comprises two C-shaped lock parts which, in addition to a respective

stud/recess pair arranged in the region of the bows of the chain lock, are provided with a further stud/recess pair in the region of the center of the longitudinal webs of the chain lock. All three last-described chain  
5 locks are not capable of being fully satisfactory insofar as the additional, central support requires a significantly increased outlay on manufacturing and the measures taken in the center of the lock also do not lead to the lasting reduction of the stresses acting on  
10 the respectively single retaining web of the studs in the bow regions of the chain locks.

#### **Summary of the invention**

15 The invention is based on the object, in the case of a chain lock of the generic type under consideration, of obtaining an increase in the static and dynamic stress by means of an optimized distribution of the forces and stresses occurring under load in the lock. The object  
20 set is achieved according to the invention by the fact that the height of the stud and of the recess is equal to the inner width of the lock, and by the fact that the stud has a plurality of retaining webs arranged one above another and the recess has a plurality of  
25 retaining grooves arranged one above another.

The multistage design of the studs and recesses and the selection of a greater height of the studs and recesses in comparison to the known constructions leads to a  
30 balanced and favorable distribution of the stresses and, in particular, of the transverse forces in the coupling region of the lock parts and, as a result, makes the sought increase in strength possible.

35 Further features and details of the invention emerge from the subclaims and the description below of a

particularly advantageous embodiment of the invention which is illustrated in the accompanying drawings.

- 5 Continued on page 2, line 13 of the original [German] application documents.

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5 New claim 1:

A chain lock for link chains with two lock parts (1) which can be displaced by limited amounts with respect to each other in the longitudinal direction of the lock  
10 in order to open and close the lock and in each case have two ends which are connected to each other via a longitudinal web (2) and of which in each case one forms a stud (5) having a retaining web (7) extending over part of the circumference of the stud and one is  
15 provided with a recess (6) serving to receive the stud (5) and having a retaining groove (13) for the retaining web (7), characterized in that the height (H) of the stud (5) and of the recess (6) is equal to the inner width ( $b_i$ ) of the lock, and in that the stud (5)  
20 has a plurality of retaining webs (7, 8) arranged one above another and the recess (6) has a plurality of retaining grooves (13, 14) arranged one above another.

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5 New claim 11:

A chain lock for link chains with two lock parts (1) which can be displaced by limited amounts with respect to each other in the longitudinal direction of the lock  
10 in order to open and close the lock and in each case have two ends which are connected to each other via a longitudinal web (2) and of which in each case one forms a stud (5) having a retaining web (7) extending over part of the circumference of the stud and one is  
15 provided with a recess (6) serving to receive the stud (5) and having a retaining groove (13) for the retaining web (7), characterized in that the stud (5) has a plurality of retaining webs (7, 8) arranged one above another and the recess (6) has a plurality of  
20 retaining grooves (13, 14) arranged one above another.